Enhancing Smart System Platforms: Factors Affecting People's Intentions Toward Smart Homes in Jordan

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ABSTRACT

Smart systems are going to transform the social life of modern society. Notwithstanding the benefits of these systems, their use is still low in the developing world, including Jordan. This study aims to construct a novel model to identify the factors that affect people's intention to use smart systems in their homes. A survey was conducted on 650 individuals among which 550 valid questionnaires were considered in Jordan. The collected data were analyzed for descriptive analysis and further to validate the hypothesis using structural equation modeling. The findings showed that there is a significant relationship between individuals' attitudes related to PU and PEOU with their intention toward using smart systems in their lifestyle. It indicated that the research model explains 68.6% of the variance in the individual's intention to use smart systems in their residence. Practically, it is fruitful to the top management of IT companies that offer smart systems. Moreover, the chapter enhances the current systems and organizes a strategic plan for implementation within best practice.

KEYWORDS

Attitude, Intention to Use, Internet of Things, Jordan, Smart Homes, Technology Acceptance Model

INTRODUCTION

In recent times, technologies were increasingly developed and spread in many fields of our life, the word "Smart" has become most popular which improve and accelerate our daily activities. It is known that many technologies are affecting new style of our life such as sensors, actuators, Radio Frequency Identification (RFID), Middleware, wireless communications protocols, and others, together with the technologies and theories such as Artificial Intelligence (AI), Internet of Things (IoT) and distributed computing which consider the most potentially industrial revolution over information era (Atzori et al., 2010). Consequently, these technologies are predicted to support a sustainable evolution of smart cities in the future (Atzori et al., 2010).

Recently, IoT which is considered as one of the most important technology defined as a global network that connected many devices uniquely addressable, based on standard communication protocols (Hutchison & Charlesworth, 2011). IoT, however, consists of three major elements; Hardware, Middleware, and Interface. The first element is the device itself such as microprocessor, sensors, or any communication hardware. Middleware is an intermediate software that helps developers to develop

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their applications in an ease way without distraction from complexity of various technologies. Lastly, Interface support end-users in a simple and easy presentation to use the applications in the best way (Gubbia et al., 2013). Consequently, IoT applications were classified into three dimensions; personal applications, enterprise applications, and utility applications (Gubbia et al., 2013). Certainly, mobile applications expand across all dimensions due to their kind of connectivity, flexibility, and scalability (Miorandi et al., 2012; Gubbia et al., 2013).

As one of the main crucial dimensions in IoT, smart buildings including smart home systems which deliver services to individuals through connected devices and applications to the Internet technology (Alaa et al., 2017). It has been changed the individual's lifestyle by connecting every device to the Internet all the time (Samuel, 2016). Consequently, smart building systems are a set of devices such as domestic appliances and buildings equipment connected with a communications network and Internet, supported by linking sensors, applications, and related technologies, that can be remotely monitored, accessed, or controlled and which provide services that respond to the needs of its inhabitants (Balta-Ozkan et al., 2014).

Nowadays, almost all the control applications of smart building devices have fixed rules and procedures, this means a rigid and complicated way to be changed, so the individuals could not have convenient smart buildings services in their complex (Xu et al., 2016). In context, AI and neural networks can learn individuals living habits, thus, provides convenient and appropriate using smart buildings services with ongoing improvements (Schmidhuber, 2015). The main features of smart buildings through using AI systems are; the integration of connected devices, awareness of individual's needs of it, individuals adaptive of using it, customization of devices related to the individual's needs, and predict individuals' needs without external intervention. Therefore, the main characteristics of smart systems based on AI are embedded, by integrating the connected devices to the environment; context-aware, the inhabitants' context can be recognized by the devices; personalized, the smart systems can be customized according to inhabitants' needs; adaptive, the smart systems can adapt to inhabitants' context; and anticipatory, the smart systems can predict inhabitants' needs (Madakam et al., 2015).

Jordan is one of the highly developed country in the Arab world. There are some companies launched smart systems services in homes, buildings and organizations such as Ur Smart House, Umniah, Zain and Huawei Companies (PETRA, 2019). These companies support many services such as building security, heating control, lighting control, remote controlling system, home appliances management, and other services. However, these smart services manage, monitor, and control smart devices and their application platforms twenty-four seven. Moreover, it provides individuals with useful usage, convenient and intelligent features to monitor, manage, and control their home, buildings and offices by their smartphone applications.

LITERATURE REVIEW

The existing new technologies and adoption theories researches, including smart homes, buildings, and cities, in addition to IoT literature, provide rich background of factors as challenges and opportunities of technology adoption (Ehrenhard et al., 2014; Park et al., 2018). TAM which was suggested by Davis (1989) is considered one of the basic theoretical theories for technology acceptance. According to TAM, Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are two technological determinant factors Davis (1989) that influence the individuals' Behavioral Intention (BI) to use new technologies among their Attitude (ATT).

According to TAM, PU is defined as "The degree to which a person believes that using a particular system would enhance his or her job performance". Meanwhile, PEOU is defined as "The degree to which a person believes that using a particular system would be free of effort". Consequently, TAM defined ATT as "The degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question". Also, BI means "The strength of one's intention to perform

a specified behavior” (Davis, 1989). The individuals’ perspective is based on all behaviors and human actions which are acquired from behavioral responses to environmental stimuli, which can be measured and perceived (Kearney & Trull, 2014). Further, many researchers confirmed TAM in terms of the reliability, validity, and consistency of the instrument in new technologies such as smart buildings and IoT. They have verified that PU and PEOU have significant relationships with ATT, BI, to adopt, accept and use new technologies and services (Alaiad & Zhou, 2017; Yang et al., 2017; Park et al., 2018). The adoption and usage of smart systems in houses, buildings and cities are still low by individuals, and groups, (Mani & Chouk, 2016). Consequently, still not spread in developing countries such as Jordan (Park et al., 2017). Many researchers present that smart buildings system may be canceled before completed (Van Hoof et al., 2017). However, the lack of adoption and accept new technologies among individuals is considered a disappointment of the IoT companies around the world in general, developing nations in specific (Mani & Chouk, 2016).

Some of the identified influencing factors include Perceived Relative Advantages (PRA) which is mean “The degree to which an innovation is subjectively perceived as better than its alternatives methods available” (Rogers, 2003). Many studies concern about the influencing of PRA to use and adopt smart buildings among individuals such as (Shih, 2013; Wilson et al., 2015; Chang et al., 2020). On the other hand, the Perceived Compatibility (PCOMT) which is mean “the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters” (Rogers, 2003); there are many studies present the effect of PCOMT to accept and use new technologies such as IoT and smart buildings. In a South Korea, two studies concern the extended TAM to present the individual acceptance of smart home facilities (Park et al., 2017; Park et al., 2018; Lu, 2021).

Consequently, Perceived Connectedness (PCONN) which is means “the degree to which users are emotionally connected with the world, its resources, and people” (Yoon & Kim, 2007). Park et al. (2018) focus on the PCONN which is influences the acceptance of using smart buildings and their services. In addition, (Park et al., 2017) showed the influenced of PCONN on IoT technologies in a smart buildings environment. Moreover, the Perceived Trialability (PTRAIL) which is means “the degree to which an innovation may be experimented with on a limited basis” (Rogers & Shoemaker, 1971). Accordingly, Shih (2013) presented the relationship between PTRAIL and individuals intend to use and accept the smart services in their homes. In addition, the researchers argued that there is relationship between PTRAIL and farmers intention to use smart services (Yoon et al., 2020; Lu, 2021).

On the other side, Perceived Cost (PCST) as another factor means “the system cost whether it is expensive or not according to the users’ financial resources” (Tornatzky & Klein, 1982; Chen et al., 2020). They argued that there is a relationship between PCST and the acceptance and use of new technologies and services related to smart home and buildings. In addition, Hong et al. (2020) showed the effect of new technologies and services prices on individuals’ intention to use these smart technologies. They also argued that the financial risk with consumer intention to use smart buildings. Finally, Perceived Privacy Risk (PPR) refers to the “potential loss of control over personal information, such as when information about you is used without your knowledge or permission” (Featherman & Pavloub, 2003). The studies supported the relationship between PPR and individuals’ intention to use smart homes and buildings (Alaiad & Zhou, 2017; Dong et al., 2017; Yang et al., 2017; Shank et al., 2021).

In relation, Dillon and Morris (1996) define user acceptance as “the demonstrable willingness within a group to employ information technology for the tasks it is designed to support”. However, the acceptance to use the new technologies has been among the issues of scientific research for over the last decades (Gattiker, 1984; Venkatesh, 2000). Further, many studies established their research models based on these adoption theories and previous studies to examine individuals’ acceptance of smart homes, buildings, and cities. Since individuals’ acceptance is critical issue for IoT companies to grow the demand for new technologies and services (Mani & Chouk, 2016; Van Hoof, 2017; Aldossari & Sidorova, 2020).

On the other hand, many studies present the benefits of applying smart buildings system based on IoT which are included: Energy Conservation: saving the energy is considered a significant matter in smart buildings by using IoT technologies which control smart devices to save energy. Therefore, smart systems enhance power management to the smart system efficiently enhance power management to increase saving energy (Kibria & Chong, 2014; Lima et al., 2015). In context, smart system support automated lighting systems that turn on/off automatically (Lee et al., 2014). On the other hand, there are saving energy in the indoor and outdoor environmental conditions depending on the air temperature, so the amount of energy consumed for smart buildings systems are inter-changed continuously as the heating and cooling system can increase at specific times (Kibria & Chong, 2014).

Healthcare Improvement: Smart buildings enhance the healthcare system in the buildings for disabled and elderly by monitoring their health and prevent loneliness (Chen et al., 2015). In addition, Robotics in smart homes and buildings help them to live healthy carefree lives (Lee et al., 2014; Chen et al., 2015), for instance, it helps them to take their prescribed medication on time and permits physicians to monitor their patients remotely (Yang et al., 2014).

Entertainment and Enjoyment: Smart buildings systems enhance convenience, safety, and security all the time (Madakam & Ramaswamy, 2014; Lee et al., 2014). For example, the systems allow individuals to pay the bills (Miorandi et al., 2012), also, it allows the individuals to control all smart devices by mobile phone via wireless (Schiefer, 2015).

RESEARCH HYPOTHESES

After identifying the research model and its proposed factors, it was essential to establish the relationships among them, this was done by formulating the research hypotheses. Actually, the critical objective of formulating the research hypotheses is to measure the relationships between factors in the research model (Sekaran, 2003). This research planned to examine and measure the significant or insignificant relationship among proposed factors that would determine the individuals' attitude and intention to use and adopt the smart devices in their homes and buildings.

Consequently, the proposed research model and the alternative hypotheses have been designed based on the TAM, DOI, and other previous works. In the past, TAM (Davis, 1989) and DOI (Rogers, 2003) had proven the hypothesis on the relationship between individuals' attitude and their intention, and PU, PEOU with individuals' attitude. However, TAM, DOI, and previous studies were proved the reliability of using the research hypotheses in this research. Thus, to achieve the research objectives a research model was developed that formulating the research hypotheses, then collecting data, and finally testing the hypotheses (Sekaran & Bougie, 2016). In conjunction, the following presents the research hypotheses that explaining the relationships among the factors.

Hypothesis One: There is a significant relationship between Perceived Relative Advantage and Perceived Usefulness to use smart services in homes among individuals in Jordan.

Hypothesis Two: There is a significant relationship between Perceived Compatibility and Perceived Usefulness to use smart services in homes among individuals in Jordan.

Hypothesis Three: There is a significant relationship between Perceived Connectedness and Perceived Ease of Use to use smart services in homes among individuals in Jordan.

Hypothesis Four: There is a significant relationship between Perceived Trialability and Perceived Ease of Use to use smart services in homes among individuals in Jordan.

Hypothesis Five: There is a significant relationship between Perceived Cost and Behavioral Intention to use smart services in homes among individuals in Jordan.

Hypothesis Six: There is a significant relationship between Perceived Privacy Risk and Behavioral Intention to use smart services in homes among individuals in Jordan.

Hypothesis Seven: There is a significant relationship between Perceived Ease of Use and Perceived Usefulness to use smart services in homes among individuals in Jordan.

Hypothesis Eight: There is a significant relationship between Perceived Usefulness and Attitude to use smart services in homes among individuals in Jordan.

Hypothesis Nine: There is a significant relationship between Perceived Ease of Use and Attitude to use smart services in homes among individuals in Jordan.

Hypothesis Ten: There is a significant relationship between Attitude and Behavioral Intention to use smart services in homes among individuals in Jordan.

RESEARCH METHODOLOGY

The review of the previous studies and academic resources such as books, scientific journals, and conference papers as well as cases of real-world examples that are gathered through the researcher's observation was examined to support the existence and proposed identified factors and associations. However, the resource, which involves any of those research factors directly or indirectly, is valuable to reveal possible relations among them. Notwithstanding the quantitative approach, testing the research hypotheses, which shows the nature of relationships. Thus, to examine the strengths of relationships among factors, the research model illustrated in Figure 1. was constructed to test the hypotheses and identify the relationships among the factors.

Figure 1 shows the proposed research model which contains the main factors that could have influenced the usage and adoption of smart buildings and homes among individuals in Jordan. For all that, the researcher used a self-administered questionnaire as the main tool for collecting data, further, it is used a cross-sectional survey and the data were gathered at one point in time using questionnaires. The questionnaire has been developed based on the research model and its hypotheses. The scale items were scored on a 5-point Likert scale that ranged from "strongly disagree" to "strongly agree". A set of experts and professors from information systems and statistics sciences, and linguistic, has reviewed the questionnaire to ensure its contents 'validity, consistency, and language drafting, and it was modified based on their suggestions and comments.

Regarding research population and sampling, the population of this research is the current population of Jordan which was estimated by 10,975,794 based on the Department of Statistics (2021). The data were collected from Jordanian citizens and residents in the three provinces (Irbid in the north, Amman in middle, and Aqaba in the south). A Random sample was used because all members in the population had an equal chance of being chosen as the members (Sekaran & Bougie, 2016). A self-administrated survey was conducted on (650) individuals from three provinces in Jordan. A total of (561) participants (86%) have responded, (11) were invalid questionnaires, (550) valid questionnaires to statistical analysis were returned representing an (85%) response rate. Whereas, the researchers argued that if the population size is greater than or equal to 500,000 members, then the minimum sample size is equal to 544 members (Zikmund et al., 2013).

Figure 1. Research Model

ANALYSIS AND RESULTS

The research used Statistical Package for Social Sciences (SPSS) version 26 and Structural Equation Modeling (SEM) to analyze the collected data. SPSS was used for descriptive analysis, in addition to ensure the reliability, validity, normal distribution, and sample adequacy of the measurement items. Further, SEM was used to assess the research model with multiple independent factors, with correlations between different independent factors, also, correlations between different dependent factors, in addition, to test the research hypotheses by using the structural model. The demographic of the respondents is shown in Table 1, it presents their gender, age, residence, educational level, income, and using technologies in their daily life.

In conjunction with, the Cronbach's Alpha test was used to examine the reliability values of the measurement items (Sekaran & Bougie, 2016). The results of the Cronbach's Alpha present in Table 2 showed that the values for all factors in the research model were larger than (0.6), which is mean reliable and could be included in the research tool (Sekaran & Bougie, 2016).

On the other side, convergent validity is promoted if the values of AVE are more than (0.5). Table 2 presents these values which are considered suitable to support the research requirements. Moreover, Table 2 presents the descriptive statistics of the research model factors. Based on the results that affected individuals' BI to use and adopt smart services in their homes and buildings, the highest

Table 1. Demographic characteristic of respondent

Variable	Items	Number	Percent
Sex	Male	334	61%
	Female	216	39%
Age (Years)	Less than 20	17	3%
	20 – less than 30	119	22%
	30 – Less than 40	114	21%
	40 – Less than 50	174	32%
	50 and more	126	22%
Provinces	North	227	41%
	Middle	191	35%
	South	132	24%
Educational level	Secondary School or less	62	11%
	B.Sc.	262	48%
	M.Sc.	125	23%
	Ph.D.	101	18%
Monthly income (JD)	Less than 500	119	22%
	500 – Less than 1000	326	59%
	1000 – Less than 1500	93	17%
	1500 and more	12	2%
Availability of home Internet	Yes	486	88%
	No	64	12%
Availability of smart phone	Yes	438	80%
	No	112	20%

Table 2. Reliability, AVE, and Mean of Research Model Factors

Factor	# of Items	Cronbach's Alpha	AVE	Means
PRA	5	0.751	0.639	4.83
PCOMP	6	0.856	0.787	4.87
PCONN	5	0.804	0.603	4.54
PTRIAL	5	0.842	0.764	4.77
PCST	5	0.841	0.746	4.72
PPR	6	0.857	0.740	3.94
PU	5	0.991	0.906	4.98
PEOU	4	0.946	0.840	4.93
ATT	5	0.855	0.637	4.81
BI	4	0.886	0.817	4.90

mean value was related to the PU, with the value of (4.98), while the lowest mean value of factors was related to the PPR, with the value of (3.94). Alongside, Skewness and Kurtosis testing was used to present the normality assessment of the measurement items. Based on the results, all measurement items of research model factors were less than (3), so, all of them are considered normally distributed (Corrado & Su, 1996). Moreover, Table 3 argues that the sample is considered adequate if the value of Kaiser Meyer Olkin (KMO) is larger than (0.6) (Coakes, 2013), and the results obtained for the degree of freedom.

Meanwhile, the discriminant validity is promoted if the square root of AVE of each factor is more than the squared correlations between factors (Fornell & Larcker, 1981). Table 4 presents the values that represent the square root of AVE, in addition to the values that represent the square correlations. It shows that all square root of AVE values are larger than R^2 values between variables, which means that all the variables are different from one another. Consequently, the correlation has explained the significance and the strength of a linear relationship between two variables (Pallant, 2007). The correlation coefficients of all research model variables are presented in Table 4.

Accordingly, the correlation coefficients between the dependent and independent factors are important and are preferred to be more than (0.3) (Pallant, 2007). Table 4 shows that all values of the correlation between the dependent and independent factors are larger than (0.3). On the other hand, the determination coefficient (R^2) is explained the level of the variance between dependent and independent factors in the research model. However, the value of R^2 is between (0) and (1) and represents the logical metric to assess the structural model. Therefore, Chin (1998b) recommended

Table 3. KMO and Bartlett's Test

KMO Measure of Sampling Adequacy		
	Degree of Freedom (DF)	0.857
Bartlett's Test of Sphericity	Regression	1
	Residual	548
	Total	549
	Approx. Chi-Square	1785.075
	Sig	0.000

Table 4. Matrix of Correlation (Square root of AVE and correlation coefficient)

Variables	PRA	PCOMP	PCONN	PTRIAL	PCST	PPR	PU	PEOU	ATT	BI
PRA	0.799									
PCOMP	0.787	0.887								
PU	0.797	0.815	0.776							
PCONN	0.654	0.644	0.593	0.874						
PTRIAL	0.494	0.552	0.566	0.502	0.863					
PEOU	0.587	0.545	0.634	0.378	0.367	0.860				
PCST	0.510	0.607	0.601	0.663	0.432	0.306	0.951			
PPR	0.737	0.792	0.715	0.802	0.691	0.368	0.589	0.916		
ATT	0.603	0.709	0.648	0.639	0.429	0.354	0.672	0.619	0.798	
BI	0.758	0.845	0.693	0.669	0.476	0.451	0.596	0.744	0.691	0.903

R² values for endogenous latent variables based on: (0.67) substantial, (0.33) moderate, (0.19) weak. However, this research involves four dependent factors (Figure 1.), the first factor is PU that is affected by PRA, and PCOMP; the second factor is PEOU that is affected by PCONN and PTRIAL; the third factor is ATT that is affected by PU and PEOU; and the fourth factor is BI that is affected by ATT, PCST, and PPR. In conjunction, Table 5 presents the values of determination coefficient R² of the dependent factors in the research model.

In consequence, a hypothesis would be accepted if the level of significant value (p) is less than (0.01), or (0.05) (Iacobucci & Churchill, 2010). However, Table 6 presents the findings of the testing hypotheses. The findings elucidate that PRA has a positive direct effect on PU (H1) with ($\beta = 0.276$, $p < 0.01$). This result is consistent with other previous studies of individual's acceptance of new technologies such as (Nikou, 2019); this means that individuals realize that adopting and using smart buildings is useful and suitable to their daily life. Therefore, the developers of smart systems make certain to support user interfaces and features, in addition, to employ convenient technologies with new devices and services to accomplish a successful diffusion of these new technologies (Hong et al., 2020). As well, the testing of the second hypothesis presents that PCOMP has a positive direct effect on PU (H2) with ($\beta = 0.565$, $p < 0.01$). This results are consistent with previous studies such as (Park et al., 2017; Park et al., 2018). Hence, the individuals agreed that the smart devices and applications were compatible with their lifestyle and integrated with their functions. So, if the smart devices and applications are not compatible with each other, individuals may find lacking usefulness in their lifestyle and functions, thus, hindering their decisions to use and adopt smart systems in their buildings. Accordingly, the results show that PCONN has a positive direct effect on PEOU (H3) with ($\beta = 0.288$, $p < 0.01$). This result is consistent with previous studies such as (Park et al., 2017; Park et al., 2018). This means individuals can access, use, and connect with the devices and applications of

Table 5. Results of R2 Values of the Dependent Factors

Factors	R ²
PU	0.645
PEOU	0.128
ATT	0.616
BI	0.686

their smart homes. Therefore, if the individuals found the smart devices and applications in homes and buildings are well-connected, they will find it easy to use.

From another perspective, the results found that PTRIAL does not has a positive direct effect on PEOU (H4) with ($\beta = 0.043$, $p < 0.05$). This results are considered not consistent with previous studies such as (Yoon et al., 2020). Hence, this is means that individuals do not feel the ease of use smart systems and application if they have the experience to use it previously. On the other hand, the factor PCST has a negative direct effect on behavioral intention to use and adopt smart devices and applications (BI) (H5) with ($\beta = -0.518$, $p < 0.01$). This results are consistent with previous studies such as (Alaiad & Zhou, 2017; Pal et al., 2018). Thus, if individuals find the smart devices and their applications are expensive, this is will reduced their ability to use and adopt these technologies (Park et al., 2017). Accordingly, the developers of the smart home devices and applications must consider the cost as a critical factor if they want to diffuse these technologies in a wide spread (Pal et al., 2018).

In the same context, the research findings found that PPR does not have a direct effect on BI (H6) with ($\beta = 0.029$, $p < 0.05$). This result is not consistent with previous studies such as (Alaiad & Zhou, 2017; Dong et al., 2017). Consequently, the individuals agreed that the smart home systems will not reveal their information private. This means that the enthusiasm of individuals to use such smart technologies in their homes and buildings regardless of their awareness of personal information disclosure (Mamonov & Benbunan-Fich, 2020). Based on the above, it important to spread the awareness of using and adopting safety systems.

In the same manner, PEOU has a positive direct effect on PU (H7) with ($\beta = 0.536$, $p < 0.01$). This result is consistent with previous studies such as (Bao et al., 2014; Pal et al., 2018). This is mean that individuals feel the use of smart systems and devices is clear, easy and flexible to interact with it.

Besides, PU has a positive direct effect on ATT (H8) with ($\beta = 0.329$, $p < 0.01$). Thus, the result is consistent with previous studies such as (Hojjati & Khodakarami, 2016; Park et al., 2018). Hence, the increase of PU of using and adoption smart systems and devices will increase the attitude to use it. In the same context, PEOU has a positive direct effect on ATT (H9) with ($\beta = 0.165$, $p < 0.01$). This result also is considered consistent with previous studies such as (Hojjati & Khodakarami, 2016; Park et al., 2018). Thus, it means when the individuals agreed that using smart systems and devices is easy, flexible, and understandable to interact with, it will increase their attitude to use and adopt it. Finally, the findings clarify that ATT has a positive direct effect on BI (H10) with ($\beta = 0.171$, $p < 0.01$). Thus, many previous studies are consistent with these results such as (Bao et al., 2014; Park

Table 6. Results of Hypotheses Testing

Hypotheses	Factor		B	p-value	Hypotheses Testing
	Independent	Dependent			
H1	PRA	PU	0.267	$p < 0.01$	Supported
H2	PCOMP	PU	0.565	$p < 0.01$	Supported
H3	PCONN	PEOU	0.288	$p < 0.01$	Supported
H4	PTRIAL	PEOU	0.043	$p > 0.05$	Not Supported
H5	PCST	BI	-0.518	$p < 0.01$	Supported
H6	PPR	BI	0.029	$p > 0.05$	Not Supported
H7	PEOU	PU	0.536	$p < 0.01$	Supported
H8	PU	ATT	0.329	$p < 0.01$	Supported
H9	PEOU	ATT	0.165	$p < 0.01$	Supported
H10	ATT	BI	0.171	$p < 0.01$	Supported

et al., 2018; Pal et al., 2018; Marikyan et al., 2020). Therefore, to increase individuals' intention to accept, use, and adopt of smart systems and devices, the factor of ATT would be more efficient which means that the individuals feel that using these smart systems is a wise idea.

RESEARCH IMPLICATIONS

The research presents a novel model for smart systems in developing world such as Jordan depends on TAM, DOI and another factors from previous studies. Therefore, the findings of this research can bridge the theoretical gap and practical usage of smart systems and devices. The research results are presenting a significant relationship between individuals' attitudes related to PU and PEOU with their intention toward using smart systems in their lifestyle. The research model explains 68.6% of the variance in the individual's intention to use smart systems in their residence.

Theoretically, the research presents a novel model for new technologies such as smart systems and devices. In addition, identifying the factors that affect people's intention to use smart systems in their homes. So, it's presenting the critical success factors that affect individuals to accept, adopt and use smart systems in their daily life. Practically, on the other side, it fruitful to the top management of IT companies that offers smart systems. Moreover, enhancing the current systems and organizing a strategic plan for implementation within best practice. So, the findings of this research can add the empirical evidence related to the use of smart systems and devices; and help the Jordanian government to assess or measure their readiness to adopt smart system.

CONCLUSION AND RECOMMENDATIONS

The research focuses to present a significant sight of the individual's intention to use and adopt smart devices and systems in their daily life. The research results showed that PTRIAL does not influence PEOU. Also, the results present that PPR does not influence the individual's intention to use and adopt the smart systems. On the other side, the results showed that there is positive significant relationships between other factors presented in the revised research model. Consequently, the research presents the strength of relationships among the independent factors and dependent factors by the variance and beta value (Miles & Shevlin, 2001). Statistical analysis was done to ensure the validation of the research model and testing hypotheses.

Consequently, the results showed that there is positive significant relationships between other factors presented in the revised research model. Consequently, the research presents the strength of relationships among the independent factors and dependent factors by the variance and beta value (Miles & Shevlin, 2001). Statistical analysis was done to ensure the validation of the research model and testing hypotheses. In the same manner, the research achieved its goals to construct a novel acceptance model for new technologies such as smart devices and systems. Moreover, it's presenting the critical success factors that affect individuals to accept, adopt and use smart systems in their daily life. Meanwhile, the variance (R^2) and Beta values determined the strengths of the relationships between independent and dependent factors. On the other hand, the research recommends measuring the influence of demographic factors such as age, sex, income, and educational level, in addition to, technology recourses availability such as the Internet; whereas many studies have shown there is a significant relationship between individuals' intention to adopt and use new technologies to their demographic characteristics (Staddon & Chow, 2008). In the same context, the research model can be measured with other individuals in other countries that have similar characteristics such as language, religion, race, and customs. However, many studies showed that individuals' intentions can be affected based on their cultural and social customs (Carter & Weerakkody, 2008). In addition, the research model could be considered as a generalized scope of innovations adoption and technology acceptance.

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